Attorney Docket No.: 13DV-14047/11716 (21635-0046)
Application No.: 09/944,708

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	KELLY et al.	)	Art Unit: 3726
Application No.:	09/944,708	)	Examiner: Marc JIMENEZ
Filed:	August 31, 2001	)	

For: METHOD OF MANUFACTURING A NICKEL- BASE ALLOY WELDING FILLER METAL

APPEAL BRIEF (REVISED)

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant files its revised Appeal Brief following the newly enacted provisions of 37 CFR 41.37. A Fee Transmittal authorizing the charging of the required fee was previously filed. A Notice of Appeal and fee were previously filed.

Real Party In Interest

The real party in interest is the General Electric Co.

Related Appeals And Interferences

Applicant is not aware of any related appeals and/or interferences.

Status Of Claims

Claims 1-13 were filed.

During prosecution, objected-to claims 6, 7, 12, and 13 were written in independent form and are allowed.

The final rejection of claims 1-5 and 8-11 is appealed. A clean copy of the appealed claims is set forth in the Appendix.

Status Of Amendments

In an Amendment After Final Rejection, objected-to claims 6, 7, 12, and 13 were written in independent form. The Amendment After Final Rejection was entered, see the Advisory Action.

Claims 6, 7, 12, and 13 are not appealed, as they were allowed.

Summary Of Claimed Subject Matter

Claim 1

Claim 1 recites a method of manufacturing a welding filler metal, whose steps are illustrated in Figure 2. (All page, line and figure number references in this section are to the present Specification.)

The method includes casting a nickel-base alloy as an extrusion rod having a diameter of from about 0.2 inch to about 0.5 inch. (page 2, lines 13-14; page 6, line 4) As used in the present application, "nickel-base" means that the composition of the alloy has more nickel present than any other element. (page 4, lines 27-28) The extrusion rod has at least about 12 grains in the cross section of the extrusion rod. (page 6, lines 8-10) See step 30 of Figure 2, and Figures 3-4. Figure 4 illustrates the extrusion rod 40 having more than 12 grains 42 in its cross section. (page 6, lines 11-13) In preliminary studies leading to the present invention, it was found that, if there are fewer than about 12 grains 42 in the cross section of the extrusion rod 40, there is a likelihood that a single grain of unfavorable extrusion orientation will dominate at least some regions along the length of the extrusion rod during the single extrusion operation, leading to unfavorable structures in the following extrusion step. (page 6, lines 14-17)

The extrusion rod 40 is extruded, in a single extrusion operation, to a diameter of less than about 0.1 inch and with an areal extrusion ratio of at least about 9:1, step 32 of Figure 2, producing a welding filler metal 52. (page 7, lines 15-

17) Figure 6 illustrates the welding filler metal 52 enclosed in an extrusion can 54 during the extrusion step 32.

Claim 2

Claim 2 (depending from claim 1) recites that the step of casting the nickel-base alloy includes the step of casting a nickel-base superalloy. The nickel-base superalloys are typically of a composition that is strengthened by the precipitation of gamma-prime phase or a related phase. (page 4, lines 28-30)

Claim 3

Claim 3 (depending from claim 1) recites a number of specific nickel-base alloys with which the present approach is operable. (page 5, line 5 to page 6, line 1)

Claim 4

Claim 4 (depending from claim 1) recites a method wherein the step of casting includes casting the nickel base alloy to an extrusion-rod diameter of about 1/4 inch, as described in (page 4, lines 7-8). Additionally, the step of extruding includes the step of extruding the extrusion rod 40 to a filler-metal diameter of from about 0.05 to about 0.06 inch, as described in (page 4, lines 12-15).

Claim 5

Claim 5 (depending from claim 1) recites that the step of extruding includes the step of extruding the extrusion rod 40 to a filler-metal diameter of from about 0.05 to about 0.06 inch, as described in (page 4, lines 12-15).

Claim 8

Claim 8 (depending from claim 1) recites that the step of extruding includes the step of extruding the extrusion rod with an areal extrusion ratio of from about 9:1 to about 25:1, as described in (page 7, lines 15-17).

Claim 9

Claim 9 recites a preferred method of manufacturing a welding filler metal, whose steps are illustrated in Figure 2.

The method includes casting a nickel-base alloy as an extrusion rod having a diameter of about 1/4 inch. (page 4, lines 24-26; page 6, lines 2-5) As noted earlier, "nickel-base" means that the composition of the alloy has more nickel present than any other element. (page 4, lines 27-28) The extrusion rod has at least about 12 grains in the 1/4 inch cross section of the extrusion rod. (page 6, lines 7-9) See step 30 of Figure 2, and Figures 3-4. Figure 4 illustrates the extrusion rod 40 having more than 12 grains 42 in its cross section. (page 6, lines 11-13) In preliminary studies leading to the present invention, it was found that, if there are fewer than about 12 grains 42 in the cross section of the extrusion rod 40, there is a likelihood that a single grain of unfavorable extrusion orientation will dominate at least some regions along the length of the extrusion rod during the single extrusion operation, leading to unfavorable structures in the following extrusion step. (page 6, lines 14-17)

The extrusion rod 40 is extruded, in a single extrusion operation, to a diameter of from about 0.05 to about 0.06 inch, step 32 of Figure 2, producing a welding filler metal 52. (page 7, lines 21-23) Figure 6 illustrates the welding filler metal 52 enclosed in an extrusion can 54 during the extrusion step 32.

Claim 10

Claim 10 (depending from claim 9) recites that the step of casting the nickel-base alloy includes the step of casting a nickel-base superalloy. The nickel-base

superalloys are typically of a composition that is strengthened by the precipitation of gamma-prime phase or a related phase. (page 4, lines 28-30)

Claim 11

Claim 11 (depending from claim 9) recites a number of specific nickel-base alloys with which the present approach is operable. (page 5, line 5 to page 6, line 1)

Ground Of Rejection To Be Reviewed On Appeal

Claims 1-5 and 8-11 are rejected under 35 USC 103 as unpatentable over Hunt US Patent 4,323,186 in view of King US Patent 4,337,886.

Argument

Sole Ground of Rejection to be reviewed on appeal. Claims 1-5 and 8-11 are rejected under 35 USC 103 as unpatentable over Hunt US Patent 4,323,186 in view of King US Patent 4,337,886.

Hunt deals with the manufacture of alloy wire by extrusion. In Hunt's approach, two pieces of material are welded end-to-end, powdered filler metal is introduced, and the assembly is extruded in a can. As stated in the Office Action (references herein to the Office Action refer to the final Office Action of April 9, 2004) at page 2, 2-3 lines from the bottom of the page, Hunt does not teach "the extrusion rod having at least about 12 grains in the cross section of the extrusion rod".

King teaches the preparation and use of welding wire made of cobalt-base alloys and having a rapidly quenched structure. There is no teaching of nickel-base alloys.

The following principle of law applies to all sec. 103 rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F2d

981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

Claim 1

Claim 1 recites in part:

> "casting a nickel-base alloy as an extrusion rod having a diameter of from about 0.2 inch to about 0.5 inch, the extrusion rod having at least about 12 grains in the cross section of the extrusion rod; and
>
> extruding the extrusion rod in a single extrusion operation to a filler-metal diameter of less than about 0.1 inch and using an areal extrusion ratio of at least about 9:1 to form the welding filler metal."

Applicant agrees with the Examiner that Hunt does not teach "the extrusion rod having at least about 12 grains in the cross section of the extrusion rod", Office Action at page 2, 2-3 lines from the bottom of the page.

King also has no teaching of this limitation. The Office Action does not point to any location in King which is asserted to have such a teaching. King deals with an entirely different situation, the casting, but not extrusion, of a cobalt-base alloy PWA-694 having only 5 percent nickel and "balance cobalt" (col. 2, lines 61-64). King teaches a cast rod made of a cobalt-base alloy, with no mention at all of a nickel-base alloy as recited in the present claims, and has no teaching that the cast rod is an extrusion rod that is thereafter reduced in diameter by extrusion. King mentions extrusion at only one location, col. 1, line 34, and that is in the context of a

background discussion of alloys that are first produced in powder (not cast) form, and then extruded. King dismisses this approach involving extrusion of power metals as being too costly and not permitting the preparation of small-diameter welding filler material.

The explanation of the rejection represents that King teaches "an extrusion rod", see last line of page 2 of the Office Action. No location of support in King for this assertion is set forth in the Office Action, and Applicant can find no such teaching. Applicant earlier asked that the Examiner indicate the source for this assertion, and none was forthcoming. In fact, King states "Welding wires...may be made by rapidly solidifying liquid metals..." (col. 1, lines 26-27) with no mention of extruding the rapidly solidified casting.

The present Specification carefully explains the importance of the number-of-grains limitation in a <u>nickel-base</u> material that is first cast and extruded to make welding filler metal, see for example paragraphs [0009] and [0021]-[0022]. The whole point of the limitation on the number of grains in the cast rod is to achieve a particular result in the next extrusion step of the nickel-base alloy. Because the cast rod of King is not subsequently extruded, there is no relevance of any teaching of King regarding grains.

Neither reference teaches the limitation " using an areal extrusion ratio of at least about 9:1" recited in claim 1. Hunt teaches extrusion ratios of 3-45 times (col. 7, lines 28-31), thus overlapping with the claimed range. However, the specific range recited in the claims yields surprising and unexpected results as compared with Hunt's teaching, see para. [0025] of the present Specification, stating in part: "If the areal extrusion ratio is less than about 9:1, the desired final structure of the welding filler metal is not obtained." Hunt, on the other hand, permits areal ratios of much less than 9:1, and in fact as low as 3:1, which would lead to unacceptable final structures if used in the present approach. The law recognizes that, where the prior art discloses extremely broad "laundry-list" ranges, the discovery of a specific narrower range, having improved properties not suggested or taught by the reference, within the broad range leads to patentability. See, for example, *Becket v. Coe*, 98 F2d 332 (CADC 1938); *In re Becket*, 33 USPQ 334 (CCPA 1937); *In re Arness*, 37 USPQ 217 (CCPA 1938). Where there is criticality of the proportions,

the recited proportions can lead to patentability. *See Ex parte Selby*, 153 USPQ 476 (Bd. Appeals 1966); *In re Waymouth*, 182 USPQ 290 (CCPA 1974). In the present case, the criticality of the numerical limitations in relation to the extrusion of nickel-base superalloys is disclosed in the specification and recited in the claims, countering any prima facie showing of obviousness based upon the overlap of ranges. Hunt does not deal with the same problem as the present invention, and is not concerned with attempting to achieve the desirable microstructure of the present approach resulting from the limitations of claim 1.

Neither reference teaches these recited limitations of the independent claim 1.

<u>Claim 2</u>

Claim 2 incorporates the limitations of claim 1, which are not taught by the references for the reasons stated previously, and which are incorporated here. Claim 2 is therefore allowable over this ground of rejection.

Claim 2 further recites in part: "casting a nickel-base superalloy". Neither reference has any explicit teaching of nickel-base superalloys. There is also no implicit teaching. A nickel-base superalloy is strengthened by the precipitation of gamma prime or a related phase. As is widely known in the art, gamma prime and related phases are based on the composition Ni_3Al. A gamma prime strengthened alloy must therefore have several percent of aluminum present. See paragraph [0019] of the present application, and US patents 5,794,338 and 5,898,994, of record. The compositions found in the table in col. 4 of Hunt are not nickel-base superalloys, nor is the cobalt-base alloy found at col. 2 line 61 of King. Neither reference deals with the subject matter of claim 2 in any way.

The explanation of the rejection references Hunt at col. 10, lines 4-8 (Office Action, page 3, line 12). This portion of Hunt has no discussion whatsoever of alloy composition, so the reliance on this portion of Hunt is unclear.

Claim 3

Claim 3 incorporates the limitations of claim 1, which are not taught by the references for the reasons stated previously, and which are incorporated here. Claim 3 is therefore allowable over this ground of rejection.

Claim 3 further recites several different nickel-base superalloys as a Markush group. Neither reference has any such teaching.

The argument presented by the Examiner is that selecting nickel-base superalloys "is a matter of obvious design choice." That is not the case when neither reference deals with nickel-base superalloys in general, or the specific nickel-base superalloys recited in claim 3. See paragraph [0008] of the present specification, which states in part: "Examples of nickel-base superalloys operable with the present invention include Rene' 142, Rene' 195, Rene' N5, Rene' N6, PWA 1480, and PWA 1484." These are the alloys recited in claim 3, and are called out by both name and composition in claim 3. It cannot be a matter of obvious design choice to select alloys of a type that are not dealt with at all in either of the references. The concept of "design choice" is not intended to substitute for statutory prior art. It provides a means by which one of several realistic alternatives presented by statutory prior art may be selected, absent surprising or unexpected advantages. It is to be used only where the applied statutory prior art sets forth a list of realistic alternative selections, and it would be a matter of design choice to select one member from the list. In this case, the prior art of record presents no such design choice, and accordingly the application of "design choice" is not appropriate here. Neither of the applied references has any explicit or inherent teaching of the nickel-base superalloys recited in claim 3. Applicant explained why the limited ductility of nickel-base superalloys makes them difficult to process by conventional approaches, see paragraph [0003] of the present application. Consequently, the ability to extrude these materials does present a surprising and unexpected result relative to the applied references.

Regarding the third full paragraph on page 3 of the Office Action, the cited case authority is not applicable because there is no teaching of the present process in the applied references for the reasons stated above.

Claim 4

Claim 4 incorporates the limitations of claim 1, which are not taught by the references for the reasons stated previously, and which are incorporated here. Claim 4 is therefore allowable over this ground of rejection.

Claim 4 further recites in part:

> "casting the nickel base alloy to an extrusion-rod diameter of about 1/4 inch, and wherein the step of extruding includes the step of extruding the extrusion rod to a filler-metal diameter of from about 0.05 to about 0.06 inch"

Neither reference has any such teaching. Hunt teaches that the cast preform cannot have a diameter greater than 0.225 inch, and the final diameter is 0.045 inch (col. 2, lines 20-27), both of which are outside the limitations of claim 4.

Claim 5

Claim 5 incorporates the limitations of claim 1, which are not taught by the references for the reasons stated previously, and which are incorporated here. Claim 5 is therefore allowable over this ground of rejection.

Claim 5 further recites in part:

> "extruding the extrusion rod to a filler-metal diameter of from about 0.05 to about 0.06 inch"

Neither reference has any such teaching. Hunt teaches that the final diameter is 0.045 inch, which is outside the limitation of claim 5 (col. 2, lines 20-27).

Claim 8

Claim 8 incorporates the limitations of claim 1, which are not taught by the references for the reasons stated previously, and which are incorporated here. Claim 8 is therefore allowable over this ground of rejection.

Claim 8 further recites in part:

> extruding the extrusion rod with an areal extrusion ratio of from about 9:1 to about 25:1.

Neither reference has any such teaching. Hunt teaches extrusion ratios of 3-45 times (col. 7, lines 28-31), thus overlapping with the claimed range. However, the specific narrow range recited in the claims yields surprising and unexpected results as compared with Hunt's teaching, see para. [0025] of the present Specification, stating in part: "If the areal extrusion ratio is less than about 9:1, the desired final structure of the welding filler metal is not obtained." Hunt, on the other hand, permits areal ratios of much less than 9:1, and in fact as low as 3:1, which would lead to unacceptable final structures. The law recognizes that, where the prior art discloses extremely broad "laundry-list" ranges, the discovery of a specific narrower range, having improved properties not suggested or taught by the reference, within the broad range leads to patentability. In this case, Hunt does not deal with the same problem as the present invention, and is not concerned with attempting to achieve the desirable microstructure of the present approach resulting from the limitations of claim 1 in combination with those of claim 8.

Claim 9

Claim 9 recites in part:

> "casting a nickel-base alloy as an extrusion rod of about 1/4 inch diameter, the extrusion rod having at least about 12 grains in the 1/4 inch diameter cross section of the extrusion rod; and

extruding the extrusion rod in a single extrusion operation to a filler-metal diameter of from about 0.05 to about 0.06 inch."

Applicant agrees with the Examiner that Hunt does not teach "the extrusion rod having at least about 12 grains in the cross section of the extrusion rod", Office Action at page 2, 2-3 lines from the bottom of the page.

King also has no teaching of this limitation. The Office Action does not point to any location in King which is asserted to have such a teaching. King deals with an entirely different situation: the casting, but not extrusion, of a cobalt-base alloy PWA-694 having only 5 percent nickel and "balance cobalt" (col. 2, lines 61-64). King teaches a cast rod made of a cobalt-base alloy, with no mention at all of a nickel-base alloy as recited in the present claims, and has no teaching that the cast rod is an extrusion rod that is thereafter reduced in diameter by extrusion. King mentions extrusion at only one location, col. 1, line 34, and that is in the context of a background discussion of alloys that are first produced in powder (not cast) form, and then extruded. King dismisses this approach involving extrusion of power metals as being too costly and not permitting the preparation of small-diameter welding filler material.

The explanation of the rejection represents that King teaches "an extrusion rod", see last line of page 2 of the Office Action. No location of support in King for this assertion is set forth in the Office Action, and Applicant can find no such teaching. Applicant earlier asked that the Examiner indicate the source for this assertion, and none was forthcoming. In fact, King states "Welding wires...may be made by rapidly solidifying liquid metals..." (col. 1, lines 26-27) with no mention of extruding the rapidly solidified casting.

The present Specification carefully explains the importance of the number-of-grains limitation in a <u>nickel-base</u> material that is first cast and extruded to make welding filler metal, see for example paragraphs [0009] and [0021]-[0022]. The whole point of the limitation on the number of grains in the cast rod is to achieve a particular result in the next extrusion step of the nickel-base alloy. Because the cast rod of King is not subsequently extruded, there is no relevance of any teaching of King regarding grains.

Neither references teaches the limitation "casting a nickel-base alloy as an extrusion rod of about 1/4 inch diameter" recited in claim 9. Hunt teaches that "...the cast preform must have a diameter no greater than 0.225 inch. Actually the more practical maximum diameter for the preform would be 0.180 inch..." (col. 2, lines 23-27) Hunt's teaching excludes the claim limitation of "about 1/4 inch diameter", since 0.225 inch is substantially less than 1/4 inch (0.250 inch).

Claim 10

Claim 10 incorporates the limitations of claim 9, which are not taught by the references for the reasons stated previously, and which are incorporated here. Claim 10 is therefore allowable over this ground of rejection.

Claim 10 further recites in part: "casting a nickel-base superalloy". Neither reference has any explicit teaching of nickel-base superalloys. There is also no implicit teaching. A nickel-base superalloy is strengthened by the precipitation of gamma prime or a related phase. As is widely known in the art, gamma prime and related phases are based on the composition Ni_3Al. A gamma prime strengthened alloy must therefore have several percent of aluminum present. See paragraph [0019] of the present application, and US patents 5,794,338 and 5,898,994, of record. The compositions found in the table in col. 4 of Hunt are not nickel-base superalloys, nor is the cobalt-base alloy found at col. 2 line 61 of King. Neither reference deals with the subject matter of claim 10 in any way.

The explanation of the rejection references Hunt at col. 10, lines 4-8 (Office Action, page 3, line 12). This portion of Hunt has no discussion whatsoever of alloy composition, so the reliance on this portion of Hunt is unclear.

Claim 11

Claim 11 incorporates the limitations of claim 9, which are not taught by the references for the reasons stated previously, and which are incorporated here. Claim 2 is therefore allowable over this ground of rejection.

Claim 11 further recites several different nickel-base superalloys as a Markush group. Neither reference has any such teaching.

The argument presented by the Examiner is that selecting nickel-base superalloys "is a matter of obvious design choice." That is not the case when neither reference deals with nickel-base superalloys in general, or the specific nickel-base superalloys recited in claim 11. See paragraph [0008] of the present specification, which states in part: "Examples of nickel-base superalloys operable with the present invention include Rene' 142, Rene' 195, Rene' N5, Rene' N6, PWA 1480, and PWA 1484." These are the alloys recited in claim 11, and are called out by both name and composition in claim 11. It cannot be a matter of obvious design choice to select alloys of a type that are not dealt with at all in either of the references. The concept of "design choice" is not intended to substitute for statutory prior art. It provides a means by which one of several realistic alternatives presented by statutory prior art may be selected, absent surprising or unexpected advantages. It is to be used only where the applied statutory prior art sets forth a list of realistic alternative selections, and it would be a matter of design choice to select one member from the list. In this case, the prior art of record presents no such design choice, and accordingly the application of "design choice" is not appropriate here. Neither of the applied references has any explicit or inherent teaching of the nickel-base superalloys recited in claim 11. Applicant explained why the limited ductility of nickel-base superalloys makes them difficult to process by conventional approaches, see paragraph [0003] of the present application. Consequently, the ability to extrude these materials does present a surprising and unexpected result relative to the applied references.

Regarding the third full paragraph on page 3 of the Office Action, the cited case authority is not applicable because there is no teaching of the present process in the applied references for the reasons stated above.

<u>Claims 1-5 and 8-11</u>

The following applies to the rejections of all of the claims.

The present rejection seeks to perform a hindsight reconstruction based upon unrelated references, which is technically unsupported and is legally improper. The case authority and the MPEP provide guidance on this point. The present rejection is a sec. 103 combination rejection. It is well established that a proper sec. 103 combination rejection requires more than just finding in the references the elements recited in the claim (but which was not done here). To reach a proper teaching of an article or process through a combination of references, there must be stated an objective motivation to combine the teachings of the references, not a hindsight rationalization in light of the disclosure of the specification being examined. MPEP 2143 and 2143.01. See also, for example, *In re Fine*, 5 USPQ2d 1596, 1598 (at headnote 1) (Fed.Cir. 1988), *In re Laskowski*, 10 USPQ2d 1397, 1398 (Fed.Cir. 1989), *W.L. Gore & Associates v. Garlock, Inc.*, 220 USPQ 303, 311-313 (Fed. Cir., 1983), and *Ex parte Levengood*, 28 USPQ2d 1300 (Board of Appeals and Interferences, 1993); *Ex parte Chicago Rawhide Manufacturing Co.*, 223 USPQ 351 (Board of Appeals 1984). As stated in *In re Fine* at 5 USPQ2d 1598:

> "The PTO has the burden under section 103 to establish a prima facie case of obviousness. [citation omitted] It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

And, at 5 USPQ2d 1600:

> "One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

Following this authority, the MPEP states that the examiner must provide such an objective basis for combining the teachings of the applied prior art. In constructing such rejections, MPEP 2143.01 provides specific instructions as to what must be shown in order to extract specific teachings from the individual references:

"Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)."

* * * * *

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)."

* * * * *

"A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd.Pat.App.& Inter. 1993)."

Here, there is set forth no objective basis for combining the teachings of the references in the manner used by this rejection, and selecting the helpful portions from each reference while ignoring the unhelpful portions. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure. The rationale urged in the explanation of the rejection, increasing malleability of the rod to endure the moderate bending imposed by automatic welding wire feeders, has nothing to do with the recited extrusion process. This rationale is drawn from King, but as discussed earlier King

deals with cast, but not extruded, cobalt-base alloys, not the recited nickel-base alloys. The present claims do not recite malleability, but instead recite extrusion.

The present rejection is a straightforward example of importing teachings from an unrelated reference in an attempt to produce a rejection. Hunt teaches some of the limitations of the claims, but admittedly does not teach others. The rationale for relying on King, an unrelated reference, is that only a specific teaching of King, a statement of grain size in an unrelated context of casting of cobalt-base alloys, is to be drawn from King. (Office Action, page 4, lines 8-11). It is not permissible to draw isolated teachings from an unrelated reference. The entire teachings of the reference must be considered, not only those that are helpful in constructing the rejection. The selective use of only the helpful teachings of a reference, and not giving weight to the overall teachings of the reference, in this manner is a <u>per se</u> hindsight reconstruction. This approach is not proper. In *In re Mercer*, 185 USPQ 774, 778 (CCPA 1975), the CCPA stated:

> "The relevant portions of a reference include not only those teachings which would suggest particular aspects of an invention to one having ordinary skill in the art, but also those teachings which would lead such a person away from the claimed invention. *See In re Lunsford*, 53 CCPA 986, 357 F.2d 380, 148 USPQ 716 (1966)."
>
> "The Board's approach amounts in substance, to nothing more than a hindsight 'reconstruction' of the claimed invention by relying on isolated teachings of the prior art without considering the over-all context within which those teachings are presented. Without the benefit of appellant's disclosure, a person having ordinary skill in the art would not know what portions of the disclosure of the reference to consider and what portions to disregard as irrelevant, or misleading. *See In re Wesslau*, 53 CCPA 746, 353 F.2d 238, 147 USPQ 391 (1965)."

The present situation is exactly that rejected by *In re Mercer* and many other binding decisions.

SUMMARY AND CONCLUSION

Hunt lacks any teaching of important limitations of both the independent and dependent claims of the present application. King, which has been shown to be an unrelated reference, is relied upon for those teachings. Applicant has demonstrated that neither Hunt nor King teaches certain limitations of the rejected claims, and that King's teachings are not pertinent in any event because King deals with cast cobalt-base alloys, not extruded nickel-base alloys and nickel-base superalloys.

Applicant asks that the Board reverse the rejections of claims 1-5 and 8-11.

Respectfully submitted,

Dated: November 19, 2004

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CLAIMS APPENDIX

Claims On Appeal

1. A method of manufacturing a welding filler metal, comprising the steps of

casting a nickel-base alloy as an extrusion rod having a diameter of from about 0.2 inch to about 0.5 inch, the extrusion rod having at least about 12 grains in the cross section of the extrusion rod; and

extruding the extrusion rod in a single extrusion operation to a filler-metal diameter of less than about 0.1 inch and using an areal extrusion ratio of at least about 9:1 to form the welding filler metal.

2. The method of claim 1, wherein the step of casting the nickel-base alloy includes the step of

casting a nickel-base superalloy.

3. The method of claim 1, wherein the step of casting includes the step of

casting a nickel-base alloy having a composition selected from the group consisting of Rene' 195, which has a nominal composition in weight percent of about 7.4-7.8 percent chromium, about 5.3-5.6 percent tantalum, about 2.9-3.3 percent cobalt, about 7.6-8.0 percent aluminum, about 0.12-0.18 percent hafnium, about 0.5-0.6 percent silicon, about 3.7-4.0 percent tungsten, about 1.5-1.8 percent rhenium, about 0.01-0.03 percent carbon, about 0.01-0.02 percent boron, remainder nickel and incidental impurities; Rene' N5, which has a nominal composition in weight percent of about 7.5 percent cobalt, about 7 percent chromium, about 6.2 percent aluminum, about 6.5 percent tantalum, about 5 percent tungsten, about 1.5 percent molybdenum, about 3 percent rhenium, about 0.05 percent carbon, about 0.004 percent boron, about 0.15 percent hafnium, up to about 0.01 percent yttrium, balance nickel and incidental impurities; Rene' N6, which has a nominal composition in weight percent of about 12.5 percent cobalt, about 4.2 percent chromium, about 1.4 percent molybdenum, about 5.75 percent tungsten, about 5.4 percent rhenium, about 7.2 percent tantalum, about 5.75 percent aluminum, about 0.15 percent

hafnium, about 0.05 percent carbon, about 0.004 percent boron, about 0.01 percent yttrium, balance nickel and incidental impurities; Rene 142, which has a nominal composition, in weight percent, of about 12 percent cobalt, about 6.8 percent chromium, about 1.5 percent molybdenum, about 4.9 percent tungsten, about 6.4 percent tantalum, about 6.2 percent aluminum, about 2.8 percent rhenium, about 1.5 percent hafnium, about 0.1 percent carbon, about 0.015 percent boron, balance nickel and incidental impurities; PWA1480, which has a nominal composition in weight percent of about 5.00 percent cobalt, about 10.0 percent chromium, about 4.00 percent tungsten, about 12.0 percent tantalum, about 5.00 percent aluminum, about 1.5 percent titanium, balance nickel and incidental impurities; and PWA1484, which has a nominal composition in weight percent of about 10.00 percent cobalt, about 5.00 percent chromium, about 2.00 percent molybdenum, about 6.00 percent tungsten, about 3.00 percent rhenium, about 8.70 percent tantalum, about 5.60 percent aluminum, about 0.10 percent hafnium, balance nickel and incidental impurities.

4. The method of claim 1, wherein the step of casting includes

casting the nickel base alloy to an extrusion-rod diameter of about 1/4 inch, and wherein the step of extruding includes the step of

extruding the extrusion rod to a filler-metal diameter of from about 0.05 to about 0.06 inch.

5. The method of claim 1, wherein the step of extruding includes the step of

extruding the extrusion rod to a filler-metal diameter of from about 0.05 to about 0.06 inch.

8. The method of claim 1, wherein the step of extruding includes the step of

extruding the extrusion rod with an areal extrusion ratio of from about 9:1 to about 25:1.

9. A method of manufacturing a welding filler metal, comprising the steps of

casting a nickel-base alloy as an extrusion rod of about 1/4 inch diameter, the extrusion rod having at least about 12 grains in the 1/4 inch diameter cross section of the extrusion rod; and

extruding the extrusion rod in a single extrusion operation to a filler-metal diameter of from about 0.05 to about 0.06 inch.

10. The method of claim 9, wherein the step of casting the nickel-base alloy includes the step of

casting a nickel-base superalloy.

11. The method of claim 9, wherein the step of casting includes the step of

casting a nickel-base alloy having a composition selected from the group consisting of Rene' 195, which has a nominal composition in weight percent of about 7.4-7.8 percent chromium, about 5.3-5.6 percent tantalum, about 2.9-3.3 percent cobalt, about 7.6-8.0 percent aluminum, about 0.12-0.18 percent hafnium, about 0.5-0.6 percent silicon, about 3.7-4.0 percent tungsten, about 1.5-1.8 percent rhenium, about 0.01-0.03 percent carbon, about 0.01-0.02 percent boron, remainder nickel and incidental impurities; Rene' N5, which has a nominal composition in weight percent of about 7.5 percent cobalt, about 7 percent chromium, about 6.2 percent aluminum, about 6.5 percent tantalum, about 5 percent tungsten, about 1.5 percent molybdenum, about 3 percent rhenium, about 0.05 percent carbon, about 0.004 percent boron, about 0.15 percent hafnium, up to about 0.01 percent yttrium, balance nickel and incidental impurities; Rene' N6, which has a nominal composition in weight percent of about 12.5 percent cobalt, about 4.2 percent chromium, about 1.4 percent molybdenum, about 5.75 percent tungsten, about 5.4 percent rhenium, about 7.2 percent tantalum, about 5.75 percent aluminum, about 0.15 percent hafnium, about 0.05 percent carbon, about 0.004 percent boron, about 0.01 percent yttrium, balance nickel and incidental impurities; Rene 142, which has a nominal composition, in weight percent, of about 12 percent cobalt, about 6.8 percent chromium, about 1.5 percent molybdenum, about 4.9 percent tungsten, about 6.4

percent tantalum, about 6.2 percent aluminum, about 2.8 percent rhenium, about 1.5 percent hafnium, about 0.1 percent carbon, about 0.015 percent boron, balance nickel and incidental impurities; PWA1480, which has a nominal composition in weight percent of about 5.00 percent cobalt, about 10.0 percent chromium, about 4.00 percent tungsten, about 12.0 percent tantalum, about 5.00 percent aluminum, about 1.5 percent titanium, balance nickel and incidental impurities; and PWA1484, which has a nominal composition in weight percent of about 10.00 percent cobalt, about 5.00 percent chromium, about 2.00 percent molybdenum, about 6.00 percent tungsten, about 3.00 percent rhenium, about 8.70 percent tantalum, about 5.60 percent aluminum, about 0.10 percent hafnium, balance nickel and incidental impurities.

Evidence Appendix

None.

Related Proceedings Appendix

None.